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COMPARISON OF F-18 LABELED BMS747158 PET AND TC-99M LABELED SPECT MYOCARDIAL PERFUSION IMAGING FOR DETECTION AND EVALUATION OF CORONARY ARTERY DISEASE

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Authors: *Jamshid Maddahi, Johannes Czernin, Alexander Ehlgen, Joel Lazewatsky, Qi Zhu, Michael Phelps, David Geffen School of Medicine at UCLA, Los Angeles, CA, Lantheus Medical Imaging, Billerica, MA*

Background: F-18 labeled BMS747158 is a novel PET myocardial perfusion imaging tracer that targets mitochondrial complex 1 and is currently undergoing Phase 2 clinical evaluation. In this study, rest-stress F-18 BMS747158 PET and Tc-99m labeled SPECT were compared for detection and evaluation of coronary artery disease.

Methods: Nine patients, from a single center, underwent same-day rest-stress Tc-99m labeled SPECT and separate-day rest-stress F-18 BMS747158 PET myocardial perfusion imaging and coronary angiography. In each patient, 17 myocardial segments were visually scored on rest and stress images by nuclear cardiologists who were blinded to all other **Results:** For each patient, summed stress scores, summed rest scores, and summed difference scores were determined from segmental scores. Percent narrowing in each coronary artery was evaluated blindly and >70% luminal diameter narrowing was considered significant for presence of coronary artery disease.

Results: All 6 patients with coronary artery disease were abnormal by both SPECT and PET. Of the three normal patients, 3 were normal by PET and 2 were normal by SPECT. There were 9 diseased coronary arteries: 4 left anterior descending (LAD), 3 left circumflex (LCX), and 2 right coronary arteries (RCA). PET detected 9/9 and SPECT detected 8/9 (false negative in one LAD). There were 18 normal coronary arteries (5 LAD, 6 LCX, 7 RCA). PET identified 16/18 and SPECT identified 13/18 normal coronary arteries. Specificity for RCA was significantly higher by PET than SPECT (100% vs. 43%, $p<0.05$). The overall accuracy for correct identification of diseased coronary arteries was 93% (25/27) for PET and 78% (21/27) for SPECT. In myocardial segments that were supplied by diseased coronary arteries, summed severity score was significantly higher by PET than SPECT (16.3+9.3 vs. 8.8+6.8, $p<0.05$).

Conclusions: These preliminary data suggest that as compared to SPECT, F-18 labeled BMS747158 PET myocardial perfusion imaging has a higher specificity for detecting right coronary artery disease, and detects more severe and extensive stress perfusion abnormalities in the terrritories of diseased coronary arteries.